CLAIMS

What Is Claimed Is:

1. A method of controlling stability of a vehicle having an articulated suspension, comprising:

determining at least one dynamic property of the vehicle; and

manipulating the articulated suspension based on the at least one dynamic property to affect the stability of the vehicle.

2. A method, according to claim 1, wherein determining at least one dynamic property comprises determining at least one of the inertia, velocity, acceleration, and momentum of the vehicle.

3. A method, according to claim 1, wherein manipulating the articulated suspension comprises manipulating the articulated suspension to affect a center of gravity of the vehicle.

4. A method, according to claim 1, wherein manipulating the articulated suspension comprises manipulating the articulated suspension to affect stability limits of the vehicle.

5. A method, according to claim 1, further comprising determining at least one of an attitude and a location of the vehicle, such that manipulating the articulated suspension comprises manipulating the articulated suspension based upon the at least one of the attitude and the location of the vehicle.

6. A method, according to claim 1, further comprising determining a sprung mass and an unsprung mass of the vehicle, such that manipulating the articulated suspension comprises manipulating the articulated suspension based upon the sprung and the unsprung mass.

7. A method, according to claim 1, further comprising using a predictive model to determine how the articulated suspension is to be manipulated.

8. A method, according to claim 6, wherein using the predictive model comprises using a real-time physics model of the vehicle to determine how the articulated suspension is to be manipulated.

9. A method, according to claim 1, wherein manipulating the articulated suspension comprises articulating at least one of a plurality of wheel assemblies of the articulated suspension with respect to a chassis of the vehicle.

10. A method, according to claim 1, wherein manipulating the articulated suspension comprises actively damping the articulated suspension.

11. A method, according to claim 1, further comprising articulating at least one of a turret and a mast of the vehicle with respect to a chassis of the vehicle.

12. A method, according to claim 11, wherein articulating at least one of the turret and the mast comprises articulating at least one of the turret and the mast to substantially level loads on wheel assemblies of the articulated suspension.

13. A method, according to claim 1, wherein manipulating the articulated suspension comprises articulating at least one of a plurality of wheel assemblies with respect to a chassis of the vehicle to substantially level loads on the plurality of wheel assemblies.

14. A method of controlling stability of a vehicle having an articulated suspension, comprising:

determining a damping scenario; and

adjusting damping levels of a plurality of active dampers of the articulated suspension.

15. A method, according to claim 14, wherein determining the damping scenario comprises determining the damping scenario based upon at least one of the vehicle's mass, inertia, velocity, acceleration, attitude, position, and mission configuration.

16. A method, according to claim 14, wherein determining the damping scenario comprises determining the damping scenario based upon the terrain over which the vehicle is to travel.

17. A method, according to claim 14, further comprising sensing a dynamic response of the vehicle and analyzing the sensed dynamic response for biasing the determination of the damping scenario.

18. A method, according to claim 17, wherein sensing the dynamic response comprises sensing at least one of the vehicle's inertia, velocity, acceleration, attitude, and position.

19. A method, according to claim 17, wherein determining the damping scenario and adjusting the damping levels are carried out based upon a predictive model.

20. A method of controlling stability of a vehicle having an articulated suspension, comprising:

determining a load on each of a plurality of wheel assemblies of the articulated suspension; and

manipulating at least one component of the vehicle to affect at least one of a center of gravity of the vehicle and the vehicle's stability limits.

21. A method, according to claim 20, wherein determining the load comprises sensing a load on each suspension arm of the plurality of wheel assemblies.

22. A method, according to claim 20, wherein determining the load comprises sensing a pressure of each tire of the plurality of wheel assemblies.

23. A method, according to claim 20, wherein manipulating the at least one component comprises articulating the articulated suspension.

24. A method, according to claim 23, wherein articulating the articulated suspension comprises articulating the articulated suspension to substantially equalize the forces.

25. A method, according to claim 23, wherein articulating the articulated suspension comprises articulating at least one of the plurality of wheel assemblies with respect to a chassis of the vehicle.

26. A method, according to claim 20, wherein manipulating the at least one component comprises articulating at least one of a turret and a mast of the vehicle with respect to a chassis of the vehicle.

27. A method, according to claim 20, wherein manipulating the at least one component comprises manipulating the at least one component based upon at least one of the vehicle's mass, inertia, velocity, acceleration, attitude, position, and mission configuration.

28. A method, according to claim 20, wherein manipulating the at least one component comprises manipulating the at least one component based upon the terrain over which the vehicle is to travel.

29. A method, according to claim 20, further comprising sensing a dynamic response of the vehicle and analyzing the sensed dynamic response for biasing the manipulation of the at least one component.

30. A method, according to claim 29, wherein sensing the dynamic response comprises sensing at least one of the vehicle's inertia, velocity, acceleration, attitude, and position.

31. A method, according to claim 20, further comprising:

determining a damping scenario; and

adjusting damping levels of a plurality of active dampers of the articulated suspension.

32. A method, according to claim 31, wherein determining the damping scenario comprises determining the damping scenario based upon at least one of the vehicle's mass, inertia, velocity, acceleration, attitude, position, and mission configuration.

33. A method, according to claim 31, wherein determining the damping scenario comprises determining the damping scenario based upon the terrain over which the vehicle is to travel.

34. A method, according to claim 31, further comprising sensing a dynamic response of the vehicle and analyzing the sensed dynamic response for biasing the determination of the damping scenario.

35. A method, according to claim 31, wherein sensing the dynamic response comprises sensing at least one of the vehicle's inertia, velocity, acceleration, attitude, and position.

36. A method, according to claim 31, wherein determining the damping scenario and adjusting the damping levels are carried out based upon a predictive model.

37. A method, according to claim 20, wherein determining the load and manipulating the at least one component are carried out based upon a predictive model.

38. A system for controlling stability of an vehicle having an articulated suspension, comprising:

a plurality of sensors for sensing a state of the vehicle; and

a controller coupled with the plurality of sensors and adapted to articulate at least one component of the vehicle to affect at least one of the vehicle's center of gravity and the vehicle's stability limits.

39. A system, according to claim 38, wherein the controller comprises a predictive, feed-forward controller.

40. A system, according to claim 38, wherein the articulated suspension comprises a plurality of wheel assemblies and the plurality of sensors comprises a plurality of load sensors for sensing loads on the plurality of wheel assemblies.

41. A system, according to claim 38, wherein the articulated suspension comprises a plurality of wheel assemblies each having a tire and the plurality of sensors comprises a plurality of pressure sensors for sensing pressure within the tires.

42. A system, according to claim 38, wherein the plurality of sensors comprises at least one of a inertia sensor, a velocity sensor, an acceleration sensor, an attitude sensor, a location sensor, an odometer, a global positioning unit receiver, an inertial measurement unit, and an inclinometer.

43. A system, according to claim 38, wherein the controller employs a real-time physics model for determining how to articulate the at least one component of the vehicle.

44. A system, according to claim 38, wherein the vehicle comprises a chassis and the articulated suspension comprises a plurality of wheel assemblies articulable with respect to the chassis, such that the controller is adapted to articulate the plurality of wheel assemblies to affect at least one of the center of gravity and the stability limits of the vehicle.

45. A system, according to claim 38, wherein the vehicle comprises a chassis and at least one of a turret and a mast and the controller is adapted to articulate the at least one of

the turret and the mast to affect at least one of the center ofgravity and the stability limits of the vehicle.

46. A vehicle, comprising:

a chassis;

at least one component articulable with respect to the chassis;

a plurality of sensors for sensing a state of the vehicle; and

a controller coupled with the plurality of sensors and adapted to articulate the at least one articulable component to affect at least one of the vehicle's center of gravity and the vehicle's stability limits.

47. A vehicle, according to claim 46, wherein the controller comprises a predictive, feed-forward controller.

48. A vehicle, according to claim 46, wherein the articulated suspension comprises a plurality of wheel assemblies and the plurality of sensors comprises a plurality of load sensors for sensing loads on the plurality of wheel assemblies.

49. A vehicle, according to claim 46, wherein the articulated suspension comprises a plurality of wheel assemblies each having a tire and the plurality of sensors comprises a plurality of pressure sensors for sensing pressure within the tires.

50. A vehicle, according to claim 46, wherein the plurality of sensors comprises at least one of a inertia sensor, a velocity sensor, an acceleration sensor, an attitude sensor, a location sensor, an odometer, a global positioning unit receiver, an inertial measurement unit, and an inclinometer.

51. A vehicle, according to claim 46, wherein the controller employs a real-time physics model for determining how to articulate the at least one articulable component.

52. A vehicle, according to claim 46, wherein the articulated suspension comprises a plurality of wheel assemblies articulable with respect to the chassis and the controller is adapted to articulate the plurality of wheel assemblies to affect at least one of the center of gravity and the stability limits of the vehicle.

53. A vehicle, according to claim 46, wherein the vehicle comprises at least one of a turret and a mast and the controller is adapted to articulate the at least one of the turret and the mast to affect at least one of the center of gravity and the stability limits of the vehicle.